

NATIONAL WEATHER SERVICE WESTERN REGION SUPPLEMENT 12-2003

APPLICABLE TO INSTRUCTION 10-310

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***Operations and Services
Marine Weather, NWSI 10-310***

MARINE WEATHER SERVICES

OPR: W/WR1x4 (J. Lorens)

Certified by: W/WR1 (R. Douglas)

Type of Issuance: Routine

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Signed

07/15/03

Vickie Nadolski

Date

Director, Western Region

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A. Example

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1. Introduction. This regional supplement provides additional guidance and instructions for marine weather products and services including Coastal Waters Forecasts, Surf Zone Forecasts, and Marine Weather Statements. Written instructions cannot address every situation. Operational personnel must exercise initiative and professional judgment to minimize risk to public safety and property in instances when written instructions do not provide appropriate guidance. Personnel must balance safety and needs of customers against frequency of warnings and possible constraint of travel and commerce. Protection of life and property will take precedence in these decision-making processes.

2. Coastal Waters Forecasts (CWF).

2.1 Issuance. Western Region (WR) WFOs use the Interactive Forecast Preparation System (IFPS) to prepare coastal waters forecasts (CWFs), according to the schedule below, for their marine areas of responsibility. Gridded marine elements will be updated as needed to ensure currency. Unscheduled (updated or corrected) CWFs will be issued as necessary. Scheduled product issuance time will be no more than 30 minutes earlier, or more than 30 minutes after this schedule.

0300; 0900; 1500; 2100 (all times Pacific Local Time)

2.2 CWF Format. Refer to NWSI 10-310 (section 2.4):

2.2.1 Combining Forecast Periods. The first forecast period will stand alone (for emphasis on the short term, and to better facilitate short term updates, if required). The second and third forecast periods may be combined if wind, wave, and weather conditions are similar. Any of the forecast periods *beyond third period* may also be combined. Do NOT combine the third and fourth forecast periods, due to the exclusion of swell period in the fourth and later forecast periods.

2.2.2 Reference to National Marine Sanctuaries. WFOs Los Angeles, San Francisco Bay Area, and Seattle will reference National Marine Sanctuaries in their areas of responsibility in the SYNOPSIS description line or in the areal description line of the Mass News Disseminator (MND). (Ref NWSI 10-302, paragraph 2.3.3).

2.3 CWF Content.

2.3.1 Synopsis. WR WFOs include a brief synopsis discussing the dominant weather features (for example: highs/lows, fronts, etc.). Primary emphasis will be placed on the first 36-48 hours of the forecast, but weather features expected to result in a significant degradation (or improvement) of forecast conditions beyond 48 hours, particularly wind and/or sea conditions which would pose a significant hazard, should also be mentioned.

2.3.2 Forecast Content.

- a. Wind. Wind will be included for all forecast periods. A single prevailing wind direction should be used, unless a wind shift is predicted during the forecast period. A small range of wind direction (e.g., 45 degrees, "W-NW") may be used in areas affected by topography (e.g., bays, channels, etc.). Wind speeds will be rounded to the nearest 5 knots. Wind speed ranges should be limited to 10 knots for each marine forecast zone (for example, SW WIND 20 to 30 KT). If wind speeds are expected to exceed this range, average lower and upper values should be specified (for example, SE WIND 10 KT...BECOMING S AND INCREASING TO 30 KT). Significant differences between sustained winds and

peak gusts (10 knots or more) should also be included when expected (for example, NW WIND 20 KT GUSTING TO 30 KT). (*Exception:* Inland bays and waters may use larger ranges when appropriate to clearly depict expected conditions).

- b. Seas. The elements listed below will be included in the CWF. (*Exception:* Inland waters and bays are exempted from having detailed sea state predictions and may use a general description of wave conditions, e.g. steep, rough, choppy, etc., when it helps to convey the severity of a given situation.) In WR, inland waters include Puget Sound, the Strait of Juan de Fuca, the San Juan Islands (Camano Island to Pt. Roberts), San Francisco Bay, San Pablo Bay, Suisun Bay, and the West Delta (Sacramento/San Joaquin Rivers). For these purposes, the terms “steep” and “rough” refer to situations in which the dominant period (in seconds) is equal to or less than the wave height (in feet). “Choppy” refers to the same criteria, but for wave heights *less than five feet*. Other exceptions may apply, as noted for each element below. Refer to NWSI 10-301, Marine and Coastal Services Abbreviations and Definitions, for definitions of these parameters.
 1. Swell direction (direction swell is coming *from*, based on an eight-point compass) will be included for all forecast periods, except as noted in paragraph 2.3.2.b.6. (Combined Seas), below.
 2. Swell height (feet) will be included for all forecast periods, except as noted in paragraph 2.3.2.b.6. (Combined Seas), below. A maximum range of 2 feet should be used, except when rapidly building or subsiding trends are forecast, i.e. in a single forecast period (for example, W SWELL 7 TO 9 FT AT 10 SECONDS...BUILDING TO 15 FEET).
 3. Swell period will be included during the first three forecast periods (Note: When **combined seas** are used, substitute **dominant period** for swell period). A maximum range of 2 seconds should be used, except when rapid period changes are expected in a single forecast period (for example, W SWELL 8 FT AT 10 SECONDS...BUILDING TO 15 FT AT 17 SECONDS).
 4. “Mixed Swell”. When no single predominant swell can be identified, a “secondary swell” may also be included. Inclusion of secondary swell in any forecast period should be limited to situations in which the direction of the secondary swell can be clearly distinguished. This often occurs when the secondary swell direction differs from the primary swell by 90 degrees or more, and the height of the secondary swell is at least half the height of the primary swell.
 5. Wind wave height (feet) will be included for all forecast periods, except as noted in paragraph 2.3.2.b.6. (Combined Seas), below. A maximum range of 2 feet should be used, except when rapidly building or subsiding

trends are forecast in a single forecast period (for example, WIND WAVES 2 FT...BUILDING TO 4 TO 6 FT).

6. Combined seas (combination of swell height and wind wave height, typically synonymous with **significant wave height**) will be substituted for *swell height and wind wave height* when GALE force or stronger winds are forecast. **Combined Seas** may also be used in lieu of swell and wind wave *when the predominant swell cannot be clearly identified (most frequent in summer, when a combination of wind wave and short-period, or "fresh swell" predominates)*. A maximum range of 3 feet should be used, except when rapidly building or subsiding trends are forecast in a single forecast period (for example, COMBINED SEAS 12 FT AT 10 SECONDS...BUILDING TO 20 FT).

- c. Significant Weather / Visibility. Refer to NWSI 10-310, paragraph 2.3.8.c.

2.4 River Bar Forecasts. Certain marine areas, noted in NWSI 10-302, are too small to be separate marine zones, but often have conditions significantly different from the larger marine zone. For these areas, append specific wave and/or current information, covering generally the first two forecast periods, to the appropriate marine zone forecast as shown in the example below.

PZZ210-091630-
COLUMBIA RIVER BAR FORECAST
330 AM PDT WED APR 9 2003

IN THE MAIN CHANNEL...COMBINED SEAS 12 FT THIS MORNING
SUBSIDING TO 10 FT THIS AFTERNOON. HOWEVER...SEAS TEMPORARILY
BUILDING TO 15 FT WITH BREAKERS LIKELY AROUND THE EBB CURRENT
AT 1030 AM THIS MORNING...AND TO 11 FT AROUND THE WEAKER EBB AT
1130 PM TONIGHT.

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2.5 Small Craft Advisory Criteria.

2.5.1 Wind Speed. 21 to 33 knots, inclusive (WFOs may use up to 25 knots as the lower threshold of this range, based on customer requirements).

2.5.2 Small Craft Advisory for Hazardous Seas (SCAHS).

- a. Significant wave height for SCAHS: 10 feet or higher.
- b. SCAHS based on Wave Steepness. WFOs should also define SCAHS criteria based on *Wave Steepness*, in conjunction with wave height (wave steepness is the

ratio of wave height to wave length, and is an indicator of wave stability). Specific wave steepness criteria will be based on local customer requirements. If used, WFOs will notify WR MSD of their wave steepness criteria, and also notify WR MSD if this criteria changes.

2.6 Effective Periods for Small Craft Advisories, Gale Warnings, Storm Warnings, and Hurricane Force Wind Warnings: WFOs should collaborate closely on issues concerning Small Craft Advisory, Gale Warning, Storm Warning, and/or Hurricane Force Wind Warnings in CWFs. The following guidelines apply:

2.6.1 Small Craft Advisories. Coastal WFOs will issue Small Craft Advisories when criteria are met for the first twelve hour period, and may issue Advisories for the second forecast period when forecaster confidence is high. Additionally, *when forecaster confidence is high*, WFOs may include a headline for *expected* conditions beyond the second forecast period, for example “Small Craft Advisory Conditions Expected Tuesday”.

2.6.2 Gale Warnings, Storm Warnings, and Hurricane Force Wind Warnings. Coastal WFOs will issue Warnings when criteria are met for the first and/or second twelve hour periods, and may issue Warnings for the third forecast period when forecaster confidence is high. Additionally, *when forecaster confidence is high*, WFOs may include a headline for *expected* conditions beyond the third forecast period, for example “Gale (or Storm/Hurricane Force Wind) Warning Conditions Expected Wednesday”.

2.7 Unscheduled CWF Issuance. Refer to NWSI 10-310, section 2.4.1.

2.8 Headlines. Use headlines in the CWF to emphasize marine weather (and marine weather-related) events likely to have a significant impact on mariners and/or marine operations. Whenever possible, WFOs should limit the total number of headlines in the CWF (in each segmented portion) to a maximum of three. WFOs will use the following general wording and order of precedence as guidelines for adding headlines to CWFs:

- a. Tsunami Warning
- b. Hurricane Force Wind Warning
- c. Storm Warning
- d. Coastal Flood Warning
- e. Gale Warning
- f. Tsunami Watch
- g. Tornado Watch
- h. Severe Thunderstorm Watch.
- i. High Surf Advisory
- j. Small Craft Advisory / Small Craft Advisory for Hazardous Seas
- k. Coastal Flood Watch
- l. Gale (or Storm/Hurricane Wind) Force Winds Expected
- m. Small Craft Advisory Conditions Expected

3. Surf Zone Forecasts (SRF). The SRF supplements other public weather products by providing valuable weather and water information unique to the surf zone. The surf zone is defined as the very narrow area of water between the high tide level on the beach and the seaward side of breaking waves.

3.1 Issuance. If rip currents are forecast on a routine basis, WFOs will include this information in the SRF, in the format specified below. SRFs will be issued daily at **0200 and 1400 (Pacific Local Time)**, and updated when conditions change significantly. SRFs may be issued up to 30 minutes prior to, but not later than 30 minutes after scheduled issuance times. WFOs which do not routinely provide rip current forecasts may include such information in Marine Weather Statements (for example, in High Surf Advisories or Coastal Flood Warnings/Advisories – see paragraph 5.1.1). For WFOs issuing SRFs, High Surf and Coastal Flood events will be headlined in the SRF. Additionally, WFOs issuing SRFs will include a headline whenever a “HIGH” risk of rip currents is forecast (see paragraph 3.3d).

3.2 SRF Format. General format for the SRF is as follows:

FXXX## Kxxx (ISSUANCE DATE TIME ddhmm)
SRFxxx

SURF ZONE FORECAST
NATIONAL WEATHER SERVICE (CITY)(STATE)
(VALID TIME) AM/PM (LOCAL TIME ZONE)(DAY)(DATE)

(OVERALL AREA COVERED BY THIS FORECAST - optional)

(AREAL UGC CODE[S])-(EXPIRATION TIME)-
(FORECAST AREAL DESCRIPTOR[S] -
(VALID TIME) AM/PM (LOCAL TIME ZONE)(DAY)(DATE)

...HEADLINE (If needed)...

.Forecast text...

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Forecaster Name (Optional)

See Appendix B for example SRF

3.3 SRF Content. SRFs issued by WR offices will contain the following elements:

- a. Surf height (height of breaking waves).
- b. Primary swell height and direction. Include secondary swell, if significant.
- c. Water temperature.

- d. Rip current risk. Use “LOW” or “HIGH” (reference: NWSI 10-310, paragraph 3.6.1).

3.4 Unscheduled SRF Issuance. WFOs will update the SRF when observed or forecast elements change significantly. As needed, add either "...UPDATED" or "...CORRECTED" to the product header whenever an unscheduled SRF is issued or when an error in the SRF is corrected, respectively. Add a short description of the updated or corrected items just below the areal header to highlight the change:

FXXX## Kxxx (ISSUANCE DATE TIME ddhhmm)
SRFxxx

SURF ZONE FORECAST...**UPDATED (or ...CORRECTED)**
NATIONAL WEATHER SERVICE (CITY)(STATE)
(VALID TIME) AM/PM (LOCAL TIME ZONE)(DAY)(DATE)

(OVERALL AREA COVERED BY THIS FORECAST - optional)
(AREAL UGC CODE[S])-(EXPIRATION TIME)-
(FORECAST AREAL DESCRIPTOR[S] -
(VALID TIME) AM/PM (PST *or* PDT)(DAY)(DATE)

REASON FOR UPDATE (or CORRECTION) (no ellipses)
...HEADLINE (if necessary)...
.Text

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Forecaster Name (Optional)

4. Marine Weather Statements (MWS).

4.1 Issuance. In addition to criteria specified in NWSI 10-314, the following issuance criteria applies:

4.1.1 The MWS is used to issue, update, and cancel High Surf Advisories. High Surf Advisories will be headlined in the CWF, Zone Forecast Product (ZFP) (coastal zones only), and the SRF (for applicable WFOs). WR High Surf Advisory criteria are listed in Appendix A.

4.1.2 MWSs may also be used to provide more detailed information on significant weather predicted to occur in a WFO's coastal waters zones beyond 24 hours from the current forecast period.

4.2 MWS Format. Refer to NWSI 10-314 for MWS Format.

5. Forecast Collaboration. WFOs routinely collaborate with adjacent offices and with the Ocean Prediction Center (OPC), as necessary during the forecast process to facilitate or improve

consistency of marine forecasts, watches, warnings, and advisories. Forecasters will use available means for collaboration (chat software, telephone, intersite coordination tools (IFPS/ISC), etc.).

APPENDIX A - NWS Western Region High Surf Advisory Criteria

<u>Location</u>	<u>Criteria</u>
Cape Flattery, WA, to Cape Shoalwater, WA:	Significant Wave Height 20 FT
Cape Shoalwater, WA, to Florence, OR:	Swell energy flux 100 X 10 ⁴ j/ms.
Florence, OR, to Point St. George, CA:	Swell Height 20 FT
Point St. George, CA, to Point Arena, CA:	Significant Wave Height 18 FT
Point Arena, CA, to Point Piedras Blancas, CA:	Significant Wave Height 15 FT
Point Piedras Blancas, CA to Point Conception, CA	Significant Wave Height 10 FT
Point Conception, CA, to the U.S.-Mexico border	Significant Wave Height 7 FT

APPENDIX B - Example Surf Zone Forecast

SURF ZONE FORECAST
NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD CA
200 AM PDT THU APR 15 2003

.FOR THE BEACHES OF SOUTHERN CALIFORNIA...FOR TUE APR 15...

*THE FOLLOWING INFORMATION APPLIES WHEN RIP CURRENT POTENTIAL FORECAST IS
"LOW": DUE TO HIGHLY VARIED COASTAL TOPOGRAPHY, DANGEROUS RIP CURRENTS ARE
ALWAYS A POSSIBILITY ALONG THE SOUTHERN CALIFORNIA COASTS, AND SWIMMERS ARE
URGED TO USE CAUTION AT ALL TIMES.

CAZ039-152100-
SANTA BARBARA COUNTY SOUTH COAST-
200 AM PDT TUE APR 15 2003

.TODAY...
SURF HEIGHT.....2-4 FEET.
PRIMARY SWELL.....WSW AT 14 SECONDS.
SECONDARY SWELL.....N/A
RIP CURRENT POTENTIAL.....LOW*
WATER TEMPERATURE.....61-63 DEGREES.

REMARKS...MAX SETS TO 5 FEET.

OUTLOOK FOR WEDNESDAY...DECREASING SWELL AND SURF.

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CAZ040-152100-
VENTURA COUNTY COAST-
200 AM PDT TUE APR 15 2003

...HIGH SURF ADVISORY REMAINS IN EFFECT UNTIL 200 AM WEDNESDAY...

SURF HEIGHT.....5-8 FEET.
PRIMARY SWELL.....W AT 14 SECONDS.
SECONDARY SWELL.....S AT 17 SECONDS.
RIP CURRENT POTENTIAL.....HIGH. VERY STRONG CURRENTS AND DANGEROUS
SWIMMING CONDITIONS ARE EXPECTED.
WATER TEMPERATURE.....61-64 DEGREES.

REMARKS...MAX SETS TO 9 FEET ON EXPOSED SOUTHWEST FACING BEACHES.

OUTLOOK FOR WEDNESDAY...DECREASING SWELL AND SURF.

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CAZ041-152100-
LOS ANGELES COUNTY COAST-
200 AM PDT TUE APR 15 2003

...HIGH SURF ADVISORY REMAINS IN EFFECT UNTIL 200 AM WEDNESDAY...

SURF HEIGHT.....5-8 FEET.
PRIMARY SWELL.....W AT 14 SECONDS.
SECONDARY SWELL.....S AT 17 SECONDS.
RIP CURRENT POTENTIAL.....HIGH. VERY STRONG CURRENTS AND DANGEROUS SWIMMING
CONDITIONS ARE EXPECTED.
WATER TEMPERATURE.....62-67 DEGREES.

REMARKS...MAX SETS TO 9 FEET ON EXPOSED SOUTHWEST FACING BEACHES.

OUTLOOK FOR WEDNESDAY...DECREASING SWELL AND SURF.

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FORECASTER